

# Nevada Communications Steering Commission

RFP #007-032  
Asset Tracking and Inventory Management



# Introduction



## Agenda

- Introduction
- Project Review
- Results / Feedback
- The Opportunity

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# Introduction



## Who We Are....

Concept2 Solution is a software and solutions development company with a focus on creating solutions that deliver business efficiency and excellent ROI.



- Based in Pittsburgh, PA serving customers across the U.S. and International
- 6+ years Passive + Active RFID
- Enterprise development and integration
- Total Solution Provider

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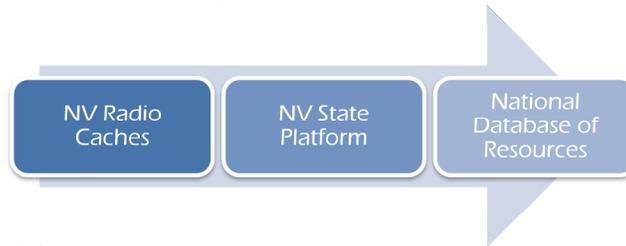
# Introduction



RFP #007-032  
Asset Tracking and Inventory Management

## Interoperability Asset Management

“The goals of this project are to improve utility and accountability for those investments by establishing efficient, shared, standardized tagging and inventory management processes.”



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This project focuses on Radio Caches, however the same centralized and standardized solution can be extended to support other assets such as vehicles, as well as people.

# Introduction

RFID-based solutions support essential features of ICS

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graph TD; ICS((ICS)); Info[Info & Intelligence Mgmt] --> ICS; Comm[Integrated Communications] --> ICS; ResTrk[Resource Tracking] --> ICS; ResMgt[Resource Management] --> ICS; CheckIn[Check-in] --> ICS; RFID[RFID] --- ICS;
```

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Building upon existing ICS objectives and processes, RFID can support and enhance key objectives and functions *without changing existing best practices and processes.*

# Introduction

RFID-based solutions support essential features of ICS

Analyze and report on accurate, timely, granular data with option to easily share to global database

Track and Validate resources to ensure interoperability

Automate status tracking & reporting

Locate resources before, during, and after incidents

Improve check-in accuracy

ICS

RFID

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An RFID-based solution provides numerous benefits that can support ICS objectives while not interfering with or otherwise affecting existing processes and procedures.

# Project Review



## Prepare

- Kickoff/ Planning
- RFID tag selection
- Define radio attributes
- Collect cache data



## Execute

- Import data
- Tag cache radios
- Provide demo equipment



## Evaluate

- Demo / Training
- South
- Reno
- Elko
- CASM Export
- 6-month access

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# Project Review



## RFID Tag Selection

**Option 1** (for models where space permits including M/A-Com)  
 Confidex Steelwave Micro RFID Tag  
 Standard 3-M adhesive + JB Quik  
 Applied to side under mic attachment



**Option 2** (for models where space does not permit Option 1)  
 AD-815 w/ 3M Transfer polyester label  
 "Gorilla" Super Glue  
 Applied to 2 surfaces (bottom and side))



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### **Functional Requirements**

- Tag must be a Gen2 Passive UHF (900-928Mhz) RFID tag
- Tag must be programmable
- Encoding of 96bits will represent data attributes of the radio including owning agency, make, frequency band, etc...

### **Physical Characteristics**

- Tag must have a minimum read range of 3ft
- Tag must be of size not to affect usage of the radios
- Tag must not affect the ability of the radio to fit appropriately in chargers, holsters, clips or cases.
- Tag must withstand normal day to day usage of the radio, including usage in harsh/inclement weather, movement in and out of chargers, holsters, clips and cases, as well as general radio handling.

### **Attachment Method**

- Tag must be able to be affixed to a radio using a method that does not damage or interfere with the operation of the radio.
- Tag must be able to be affixed to a radio in an area that does not affect operation of the Tag
- Tag must be affixed with mount/adhesive that will meet the above requirements and not interfere with the function of the radio OR tag.

# Project Review



## Radio Asset Data

- Attributes defined based upon **CASM** and **ICS Standards**
  - Make, Model, Owning Agency, Frequency Band, etc...
- 12 Agencies** provided data in standardized format for over **500 assets**
- RFID Tags** encoded with specific attribute information:

Hex Position	Field	Values	Tracker Mapping	Examples
1-3	Owning Agency	001-999	Owning Agency	001 - Clark County Office of Emergency Management 002 - Clark County Fire Department 003 - Department of Energy
4-6	Asset Type	001-999	Asset Type	001 - Communications 002 - Vehicle 003 - Person
7-9	Make	001-999	Make	001 - Ericsson 002 - M/A-COM 003 - Motorola
10-12	Frequency Band	001-999	Frequency Band	001 - VHF Low 002 - VHF High 003 - UHF
13-15	Trunking Format	001-999	Trunking Format	001 - EDACS 002 - DDE 003 - OPBS-SKY
16-18	Service Area	001-999	Service Area	001 - Eastern NV 002 - Northern NV 003 - Southern NV
19-24	Unique Tag ID	000001-999999	N/A - Unique serialized number	000001 000002 001002

Example: RFID Value... 003001003003002003000020 could be applied to the following radio:

RADIO CACHE NAME	OWNING AGENCY	TYPE	MAKE	MODEL	SERIAL #	FREQUENCY BAND	TRUNKING FORMAT	SERVICE AREA
DOE	Department of Energy	Portable	Motorola	XTS 3000	326AAW0017	UHF	DOE	Southern NV

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The team worked to define a standard set of data fields based upon both CASM as well as critical information needed for decision support. Each of the 12 agencies provided data that was imported into Tracker and used to generate the specially encoded tags. For instances where data was not available for a radio, Tracker Mobile and/or Tracker Enterprise were used to quickly enter the appropriate data.

# Project Review



## Tag Cache Radios

Owning Agency	Make	Model	Qty
<b>05.24.2010 - 05.27.2010</b>			
CCFD	Motorola	MTS2000	125
	Motorola	XTS3000	7
CCOEM	Motorola	HT1000	43
DOE	Motorola	XTS3000	9
NLVFD	Motorola	XTS5000	16
NLVPD	Motorola	XTS5000	48
UNLV	Ericsson	LPE200	12
<b>06.14.2010</b>			
Washoe County	M/A-Com	7270	49
Fallon	Motorola	XTS2500	6
<b>06.16.2010</b>			
Elko County Sheriff	Ericsson	Sat Phone	2
	Motorola	HT1000	29
	Motorola	MTS2000	28
	Motorola	XTS1500	2
Elko NDOT	Ericsson	LPE200	10
	Motorola	M11000	6
Elko NHP	Motorola	MTS2000	23
<b>06.21.2010</b>			
LVMPD	M/A-Com	7270	127
		<b>Total</b>	<b>542</b>



542 Radios Tagged!

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Over the course of 4 visits, 542 radios were tagged and validated against data imported or entered into the system. RFID Tags were applied to radios using the recommended adhesive.



The demonstrations and training focused on a use case to respond to an incident including:

- Planning
- Inventory/Staging
- Radio Distribution
- Tracking
- Reporting
- Security/Access Control

*To support these uses cases, the following options were available:*

**Mobile Portals** – Concept2 designed and constructed prototype field deployable RFID units to be used to read and track radio cache from to and from “Staging and Hot Zones”. Portals require no user interaction.

**SmartTable** – An RFID SmartTable is used to facilitate distribution processes.

**Handheld Readers** – RFID Handheld devices are used for commissioning, inventory and distribution.

**Tracker Enterprise** – provides a central repository for asset data management, reporting and administration.

# Project Review



## Planning

The screenshot displays the Tracker Enterprise software interface. On the left, the 'Custom Report Builder' is visible, showing a 'Last Run' section with a date and time of 5/26/2010 11:38:13 AM. Below this, there are several report options: 'Radio By Frequency and Timing', 'Radio By Frequency Band', and 'Radio By Frequency Band'. The 'Radio By Frequency Band' report is selected, and its details are shown in the main window. The report title is 'Radio By Frequency Band' and it was generated on 5/26/2010 11:38:13 AM. The report content is a table with the following columns: 'Agency', 'Make', 'Model', 'Serial Number', 'Frequency Band', 'Tracking Format', and 'Tracking Radio ID'. The table lists various radio units from the Clark County Fire Department, all of which are Motorola MT52000 models operating on the 800 MHz frequency band. The tracking format for all units is SHACC.

Agency	Make	Model	Serial Number	Frequency Band	Tracking Format	Tracking Radio ID
Clark County Fire Department	Motorola	MT52000	AF932532	800	SHACC	740590
Clark County Fire Department	Motorola	MT52000	AF932532	800	SHACC	740593
Clark County Fire Department	Motorola	MT52000	AF932562	800	SHACC	740594
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740595
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740599
Clark County Fire Department	Motorola	MT52000	AF932522	800	SHACC	740591
Clark County Fire Department	Motorola	MT52000	AF932562	800	SHACC	740575
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740578
Clark County Fire Department	Motorola	MT52000	AF932573	800	SHACC	740590
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740591
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740592
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740593
Clark County Fire Department	Motorola	MT52000	AF932572	800	SHACC	740594
Clark County Fire Department	Motorola	MT52000	AF93373	800	SHACC	740587
Clark County Fire Department	Motorola	MT52000	AF933782	800	SHACC	740589

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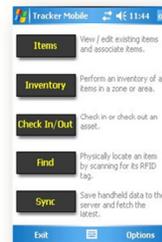
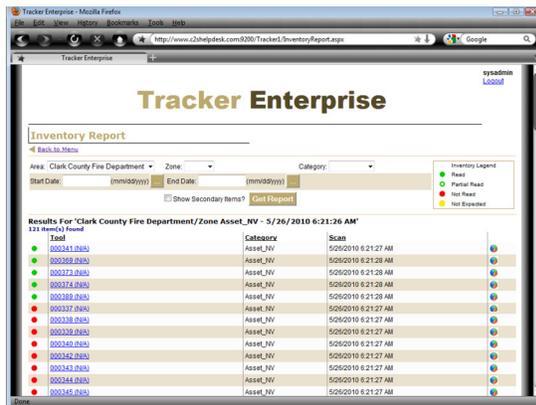


When preparing for an event/incident, Tracker provides quick and easy access to accurate Radio Cache information. Integrating with CASM, Tracker provides a completely configurable database to support not only management and tracking of radios, but of vehicles, people, etc...

# Project Review



## Inventory/Staging



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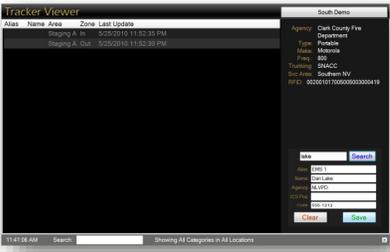
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When preparing for (or during) an event/incident, Tracker Mobile can inventory or check-in radios in seconds, providing up to date information on available radios. Radios can be inventoried during and after the event to quickly and accurately identify missing/misplaced radios.

# Project Review

## Distribution

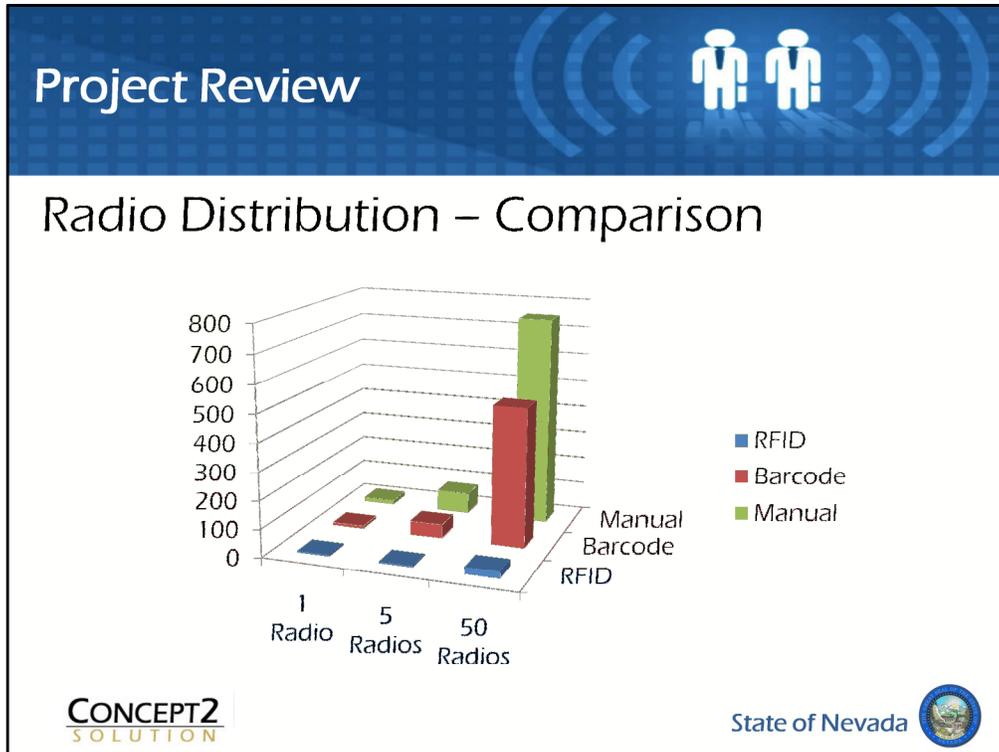





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Radios are quickly assigned and tracked with no manual effort. For example: A check-in transaction can be completed in less than 5 seconds with automatic data collection that eliminates data entry errors. Barcode and/or RFID personnel badges may facilitate the process as well. Both handheld, SmartTable, and PC-based solutions support this function.



This chart illustrates average times (in seconds) to perform Check-In/Check-Out transactions that capture the following information:

- Asset ID (What)
- Owner/Assignee (Who)
- Transaction Time (When)
- Location (Where)

Using RFID, a simple check-out transaction can occur **2x faster** than barcode and **3x faster** than manual data entry for a single radio. When checking out multiple items, the time savings increases significantly using RFID, with transactions occurring **20x faster** than barcode and **30x faster** than manual methods.

# Project Review



## Tracking

Alias	Name	Area	Zone	Last Update	Elapsed	Category	Asset ID
FF 15	Jane Doe	Hotzone	In	5/26/2010 12:05:02 PM	40s	Asset_NV	000020
EMS12	John Smith	Hotzone	In	5/26/2010 12:05:02 PM	40s	Asset_NV	000038
EMS 2	Mike Garnich	Hotzone	Out	5/26/2010 11:49:24 AM	16m 17s	Asset_NV	000369
	Staging A	In		5/25/2010 11:52:30 PM	12h 13m 5s	Asset_NV	000397
	Staging A	In		5/25/2010 11:52:28 PM	12h 13m 7s	Asset_NV	000402
	Staging A	In		5/25/2010 11:52:34 PM	12h 13m 8s	Asset_NV	000444
	Staging A	In		5/25/2010 11:52:33 PM	12h 13m 9s	Asset_NV	000447
	Staging A	In		5/25/2010 11:52:31 PM	12h 13m 10s	Asset_NV	000445
	Staging A	In		5/25/2010 11:52:10 PM	12h 13m 23s	Asset_NV	000408
	Staging A	Out		5/25/2010 11:52:18 PM	12h 13m 22s	Asset_NV	000395
	Staging A	Out		5/25/2010 11:52:12 PM	12h 13m 30s	Asset_NV	000450
	Staging A	Out		5/25/2010 11:52:12 PM	12h 13m 30s	Asset_NV	000443
	Staging A	Out		5/25/2010 11:51:49 PM	12h 13m 53s	Asset_NV	000449
	Staging A	Out		5/25/2010 11:51:23 PM	12h 14m 19s	Asset_NV	000451
	Staging A	Out		5/25/2010 11:51:18 PM	12h 14m 24s	Asset_NV	000420
	Staging A	Out		5/25/2010 11:50:36 PM	12h 15m 6s	Asset_NV	000436
	Staging A	Out		5/25/2010 11:50:12 PM	12h 15m 30s	Asset_NV	000434
	Staging A	Out		5/25/2010 11:50:11 PM	12h 15m 31s	Asset_NV	000411
	Staging A	Out		5/25/2010 11:49:28 PM	12h 16m 13s	Asset_NV	000398
	Staging A	In		5/25/2010 11:48:20 PM	12h 16m 50s	Asset_NV	000423

Mobile Portals can be set up at strategic chokepoints



Any tagged asset (or person or vehicle!) is tracked automatically and with no action required when it passes through a portal.

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Tracking using Mobile Portals provides visibility while requiring *no change to current processes*. As radios (as well as people, vehicles, and other tagged assets) move through the portals, they are automatically tracked with location information reported back to a central database.

Tracker Viewer provides the most up to date tracking and assignment information with one touch sorting and multiple filtering capabilities.

# Project Review



## Reporting

Asset	Reader(Acct)	Location(Zone)	Direction	First Scan	Last Scan
000425	Staging A	Out	None	5/25/2010 11:38:29 PM	5/25/2010 9:28:39 AM
000445	Staging A	Out	None	5/25/2010 11:52:44 PM	5/25/2010 11:52:44 PM
000447	Staging A	Out	None	5/25/2010 11:52:42 PM	5/25/2010 11:52:39 PM
000427	Staging A	Out	None	5/25/2010 11:52:31 PM	5/25/2010 11:52:31 PM
000433	Staging A	Out	None	5/25/2010 11:52:30 PM	5/25/2010 11:52:30 PM
000452	Staging A	Out	None	5/25/2010 11:52:30 PM	5/25/2010 11:52:30 PM
000420	Staging A	Out	None	5/25/2010 11:52:19 PM	5/25/2010 11:52:19 PM
000443	Staging A	Out	None	5/25/2010 11:52:19 PM	5/25/2010 11:52:19 PM
000448	Staging A	Out	None	5/25/2010 11:52:12 PM	5/25/2010 11:52:12 PM
000488	Staging A	Out	None	5/25/2010 11:52:10 PM	5/25/2010 11:52:05 PM

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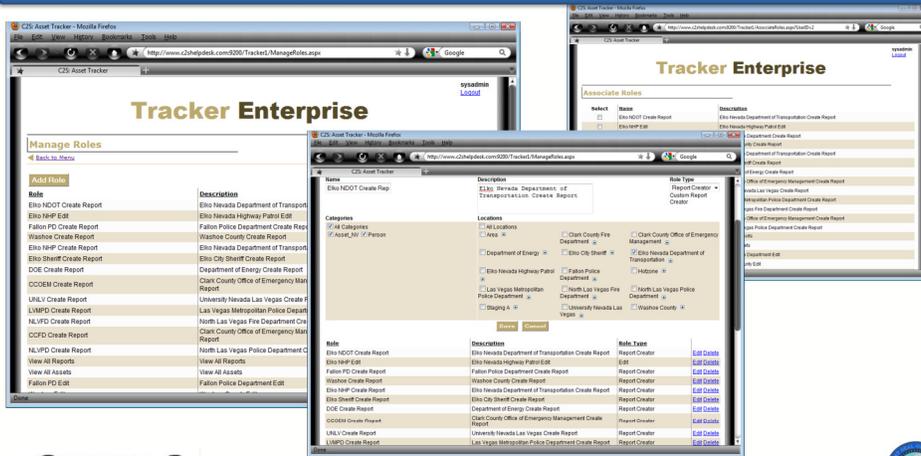


Many reporting options are available to plan, support and analyze data from the event or incident.

# Project Review



## Security and Access Control



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Tracker supports customizable roles, allowing for granular access by user, role and location. Tracker is easily configured to allow sharing of information while ensuring only the owning agencies can update their asset information. Additionally, multiple options exist to share event data to the central database.

# Results/Feedback





### Planning

- This solution supports and extends CASM to provide current status and management of individual radios.



### Inventory/Staging

- RFID delivered unmatched capabilities for auditing and inventory on-hand radio cache with the RFID enabled handheld



### Distribution

- Radio cache check in and check out using SmartTable offered significant time savings and increased accuracy of information.



### Tracking

- Tracking radio cache movement in and out of staging and hot zones works well but needs further development to be field ready.

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Over 30 people attended the demonstrations and training. The participants were involved in using the technology to perform the activities outlined for the use cases. The feedback was genuine excitement, with participants indicating positive response to utilizing this both for planned events, incidents as well as for routine/day-to-day tasks as well as for items beyond radios including people, vehicles, supplies, tools, and other communication devices.

## Results/Feedback

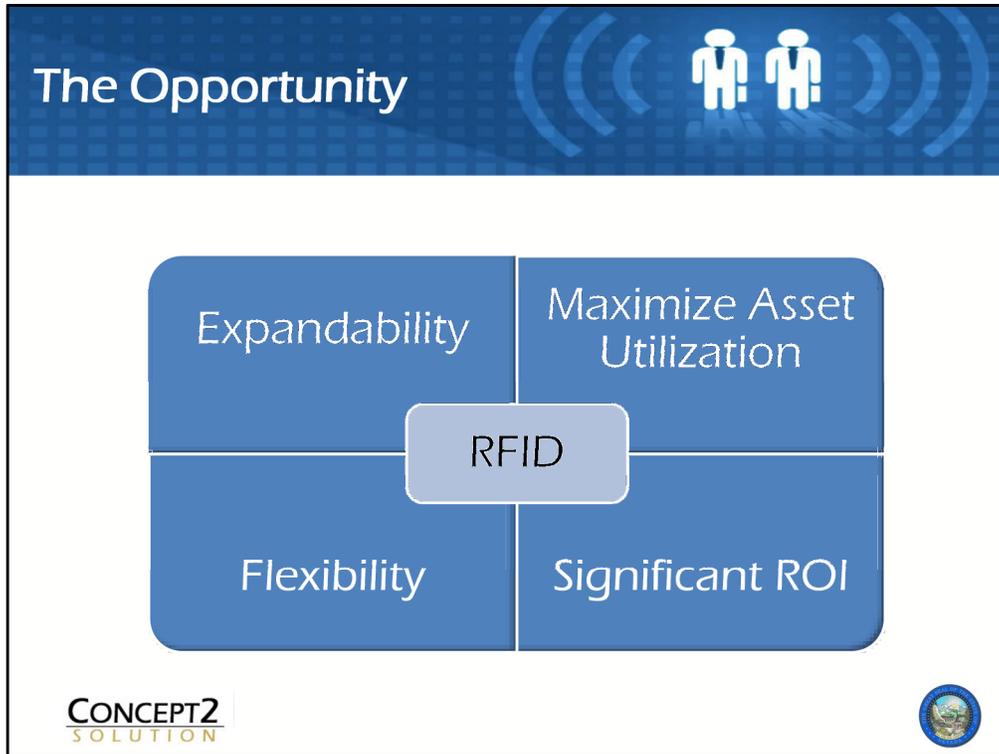


- **Standardize**
  - Continue to identify and develop standards for tagging and solution implementation based upon best practices that work with existing proven processes.
- **Expand**
  - Move beyond tracking radios by leveraging RFID to track people, vehicles and other emergency response equipment.
- **Leverage**
  - Take advantage of RFID automation for routine asset management, audit and maintenance tasks.

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The ability to deliver an automated tracking capability to the field is a great opportunity for streamlining operations . During an event focus is on the work at hand, eliminating or reducing the time spent on manually tracking assets and people is a major advantage.



The opportunity is to implement a technology that can reduce overall human resource effort, increase asset accountability and accuracy, and is easily expandable based upon the emergency event is a great advantage. Today, RFID has already proven its value to our military and other emergency response services.